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Original Research Article

Presentation and intervention in missing Copper T Thread in reference to timing of insertion

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ABSTRACT

Background: To analyse the impact of time of insertion of Copper T to presentation and intervention for management of missing Cu-T thread.

Methods: After approval of the study by research and institutional Ethics Committee, present study was carried out partly prospectively on patients presenting with missing Cu T thread. Retrospective data was also collected from minor OT or admission records for those admitted for removal of IUCD and duly completed telephonically. Proportion of women with missing Cu T thread were calculated in percentages. Correlation between different groups couldn't be calculated because of major difference in number of subjects in groups. Data was analysed with regard to relation to timing of insertion, presentation, complications, number and kind of interventions for its removal.

Results: Among 57 women, 30 had post LSCS CuT insertion, 6 had post NVD, 20 had interval CuT insertion, 1 had post abortion insertion. Misplaced CuT was detected in 8 women on USG, 4 (50%) had post LSCS, 3 (37.5%) post NVD and 1 (12.5%) had interval CuT insertion. OPD removal could be attempted successfully in 30 women; 11 (36.67%) post LSCS, 2 (33.33%) post NVD, 16 (80%) interval and 1 (100%) post abortion insertion. OT removal was needed in 23 women; 17 (56.67%) post LSCS, 2 (33.33%) post NVD, 4 (20%) interval CuT insertion. Spontaneous expulsion diagnosed in 4, 2 post LSCS and 2 post NVD CuT insertion.

Conclusions: There is definite impact of timing of Cu T insertion on incidence of misplacement and expulsion and more data and studies are needed for developing a common information performa to develop SOPs for follow up of such patients.

Keywords: Intrauterine contraceptive device, Copper T, Standard operating procedure, Hysteroscopy, Missing CuT thread

INTRODUCTION

Copper T (CuT) is an IUCD and a long-acting reversible contraceptive (LARC) method with many major advantages like noninterference with sexual intercourse, better efficacy (pearl index = 0.83), good compliance and easy to follow up. In India, where the population stood at

more than 1.2 billion at the last count, population explosion is at its worst and family planning is the need of the hour.¹ Considering the matter as serious since 1952, India was the first country in the world to launch a National Programme for Family Planning. Since then, this program has undergone many transformations in terms of policy and actual program implementation. The optimum utilisation is yet to see the light of the day.²

Previously it was mainly inserted in postpartum, post abortion phase and as an interval contraception. Later WHO advocated insertion of CuT in post placental phase following vaginal delivery and during cesarean sections. Multiple studies were done to find out the problems associated with the post placental insertion. Problems like refusal for insertion of device, spontaneous expulsion, request for removal of CuT and missing threads were reported.³⁻⁶

An IUCD is one of the safest one-time insertion methods of contraception, both for inter-pregnancy gap as well after completion of family. There is no doubt that CuT helps in immediate contraception; however, the caregivers should ensure that a mere insertion is not the end point of their services.³⁻⁵ Patients with misplaced IUCDs may present with pregnancies or 'lost strings' or they may remain asymptomatic; but the complications associated and mental stress for its removal outweighs in general population, especially when patient has to go through referrals at other centres and undergo a long and painful procedure for its removal; resulting in negative impact on the image of nearly an ideal contraceptive.^{3,7,8} It is therefore essential, that efforts should be directed to analyse complication rates that may be hampering its use. This may help rectify and boost confidence of health care providers to draw more couples towards contraceptive services.

With scant literature on the expulsion rate, missing thread and related complications at different time period of CuT insertion, the present study was planned to study various aspects associated with missing thread of CuT. The intention is better awareness of association of time of insertion and probability of expulsion, misplacements and difficulties in removal and to find probable solutions.

METHODS

The study was descriptive analytical study. The study was conducted at Government medical college and hospital sector 32, Chandigarh, India.

The study was conducted for a period of 2 years; 1-year retrospective data (march 2018 to march 2019), 1-year prospective data (March 2019 to March 2020).

Selection criteria

For present retrospective and prospective study; retrospective data of patients who underwent management for missing CuT thread in Minor Operation theatre on Outdoor patients (OPD) basis or as a major intervention in Major Operation theatre was carried out by collecting information from hospital records and duly completed with telephonic contact with such women. Study performa was filled for all the cases. Study was further extended prospectively; patients reporting with inability to feel CuT threads, incidental detection due to non-visualisation of CuT threads on examination, those referred to us with the

complaint of missing CuT thread were included in the study group whereas patients requiring CuT removal with visible thread were excluded from the study.

Procedure

At their visit, general physical examination was done. A written informed consent was obtained from all subjects. Confirmation of CuT was done with USG and X-ray Pelvis. If device was found in the uterine cavity and in normal position then consent for removal in OPD was taken and same was attempted. Patients detected with mispositioned or misplaced device and with failed attempt of CuT removal in OPD; were planned for Hysteroscopic CuT removal in major OT under anaesthesia. Women presented with missing CuT thread but device could not be located on USG or Abdomino-pelvic Xrays were considered to have spontaneous expulsion of CuT and no further intervention was done for them.

All details were recorded on proformas. In addition, Data was analysed with various interrelated factors, namely, relation to timing of insertion, presentation, complications, number and kind of interventions for its removal. Literature search for possible suggestion on remedies was also made.

Ethical approval

Approved by research and institutional ethics committee of Govt. Medical College and Hospital, sector 32, Chandigarh.

Statistical analysis

The data was entered in excel sheet. Statistical analysis was done using SPSS software (statistical package for the social sciences), version 26. The proportion of women with missing CuT thread were calculated among all women attending OPD and IPD by using percentages. Complication rates in different subgroups of patients were compared by using normal test of proportion. Correlation between different groups could not be calculated because of major difference in the number of subjects in the groups.

RESULTS

In total 69 women consulted our OPD with the complaint of missing thread of CuT, out of which 12 women could not be contacted telephonically. All these 12 women had copper T removal in OPD but because timing of insertion could not be found out, so they were not included in the study. Among 57 women, only 7 women had failed to feel the thread and reported for removal, for rest missing thread of CuT was diagnosed by doctor during physical examination.

Amongst these 23 had been referred and 32 women had chosen to report to our institute on their own. In 2 women CuT was diagnosed as incidental finding.

Table 1: USG findings.

USG findings	Patients number (n = 57)
Mid position	42
Mispositioned within uterus	7
Outside but alongside uterus	1
Pyometra with Cu T	1 (not amongst 57)
Incidental detection	1
Not seen	4 (spontaneous expulsions)
Not done	2 (coiled thread)

USG- ultrasonography, CuT- copper T

Table 2: Misplaced / mispositioned Cu T finding on USG in reference to timing of insertion.

Misplaced / mispositioned CuT	Number of patients
Total	8 (100%)
Post LSCS	4 (50%)
Post NVD	3 (37.5%)
Interval	1 (12.5%)

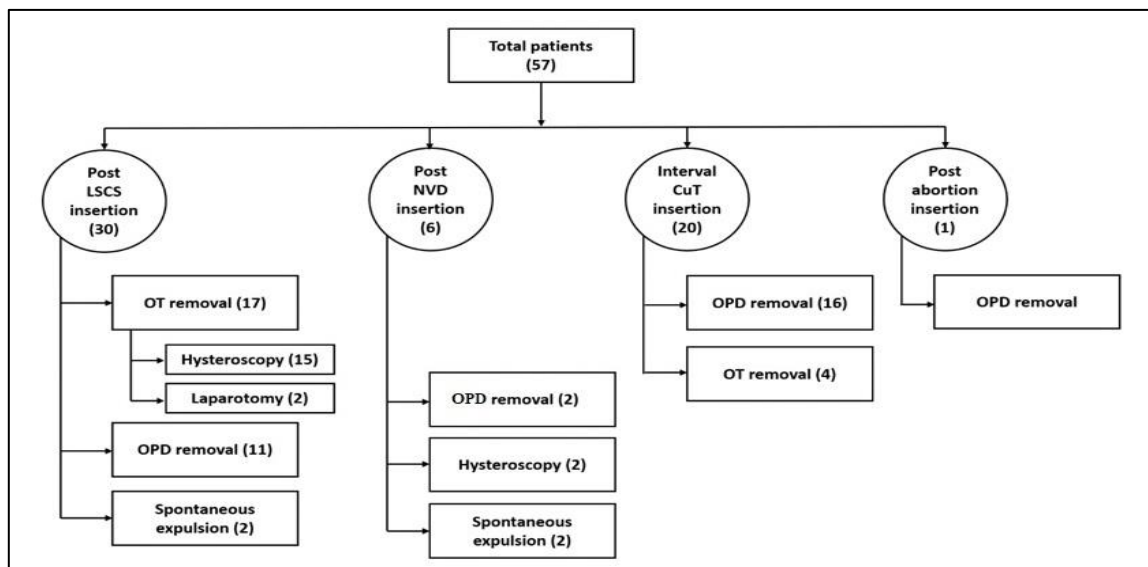
CuT- copper T, LSCS- lower segment cesarean section, NVD- normal vaginal delivery

Amongst these, 42 (60.87%) had CuT removal in minor OT attached to our OPD, using long artery forceps, CuT removing hook or uterine curette successfully. Out of 23 (40.35%) women; 21 (30.43%) women required hysteroscopy assisted removal, 2 (2.89%) women underwent laparotomy and amongst 4 (5.79%) CuT was not localized suggesting spontaneous expulsion.

Table 3: Cu T removal in relation to post NVD/ post LSCS/ interval and post abortion insertion.

Cu T insertion	Post NVD	Post LSCS	Interval insertion	Post abortion
Total	6 (100%)	30 (100%)	20 (100%)	1 (100%)
OT removal	Hysteroscopy	2 (33.33%)	17 (56.67%)	4 (20%)
	Laparotomy	2 (33.33%)	15 (88.23%)	0
OPD removal	Laparotomy	0	2 (11.76%)	0
	Spontaneous expulsion	2 (33.33%)	11 (36.67%)	16 (80%)
Not tracable	Spontaneous expulsion	2 (33.33%)	2 (6.66%)	0
Mispositioned/ misplaced		3 (50%)	4 (13.33%)	1 (5%)

CuT- copper T, LSCS- lower segment cesarean section, NVD- normal vaginal delivery, OT- operation theatre, OPD- out patient department



CuT- Copper T, LSCS- Lower segment caesarean section, OT- operation theatre, NVD – Normal vaginal delivery, OPD- Outdoor patient

Figure 1: Copper T removal.

In 2 patients unaware of CuT insertion, one presented with pyometra, ultrasound examination revealed CuT, which

was removed along with drainage of pyometra. In the other patient during hysterectomy for Fibroid uterus with

abnormal uterine bleeding, CuT piercing in uterovesical fold was identified.

For 2 women the thread had coiled up and though could be seen, both opted for removal of CuT and for both unfortunately thread broke while removal. For purpose of this study both have been included amongst our subjects.

As for number of attempts for removal, for 25 women first attempt were successful for removal. 13 women each had one or more than 1 previous failed attempt. 2 women were directly taken up for hysteroscopic removal of CuT without trying any attempt of removal in OPD.

19 women opted for reinsertion of the device wilfully on their own and 32 could be counselled and reassured for its reinsertion, 6 were not sure. Out of these women, 13 had used CuT even earlier, 2 had used barrier method and for 42 no contraception had been used earlier.

In reference to the timing of insertion for 30 women CuT had insertions during LSCS and for 6 immediate post vaginal delivery, 20 had interval CuT insertion, only one insertion followed post abortion. (Figure 1)

For all the women demanding or advocated CuT removal, a set sequence of management was evident. After history and examination, an attempt to remove CuT was made in the OPD for all women, who had USG report showing CuT insitu with the exception of two (who were directly taken up for hysteroscopic removal) and successful in 42 women. Rest women were planned for operative management accordingly.

On ultrasonography in 42 women, CuT was found in position, miss-positioned in 7, misplaced in 1 and not seen in 4. USG helped detect one forgotten CuT with pyometra and missed in 1 patient lying in utero-vesical fold, otherwise not even known to the patient. For 2 patients with coiled threads USG was not felt required before removal. (Table 1)

There was total 8 patients in whom CuT was not in normal position. In 7 women CuT was found to be inside the uterine cavity but malpositioned, like inverted, indenting the uterine fundus. In one woman CuT was lying alongside external wall of the uterus which intra-operatively found to be coming out through fimbrial end of left fallopian tube. (Table 2)

It is pertinent to note that for 30 women for whom CuT was inserted during LSCS, Cu T could be removed in OPD only in 11 (36.67%) and 17 (56.67%) required operative intervention. For 15 it was feasible to remove it via hysteroscopy but for 2, laparotomy had to be resorted to. These included 4 (13.33%) women who had misplaced CuT. For 2 spontaneous expulsions was declared on the basis of non-localization of CuT on X-ray.

20 women got interval CuT insertion. Out of all these in 16 (80%) women, removal was done in OPD and 4(20%) women had to undergo hysteroscopic CuT removal.

We could find only 6 women who got CuT insertion immediately after vaginal delivery. Out of 6, 2 (33.3%) had CuT removal by hysteroscopy, 2 (33.3%) had spontaneous expulsion and 2 (33.3%) had CuT removal in OPD. (Table 3).

DISCUSSION

Worldwide over 15% of married women rely on intrauterine contraceptive devices (IUCD) for contraception, making it as one of the most commonly used reversible method of contraception among married women of reproductive age.⁹ They are of two types of IUCD's, hormonal and non-hormonal. CuT is non-hormonal IUCD and is provided free of cost by Government of India. It provides very effective, safe and long-term protection against pregnancy, with prompt return to fertility upon removal. Their use is convenient, don't interfere with sexual activity, do not require daily action on the part of the user or repeated clinic visits for supplies and provide long term contraceptive effect even if patient avoids follow up. IUCDs have limited contraindications like acute pelvic infections, uterine malformations and known case of carcinoma cervix.

It has a failure rate of less than 0.2 per 100 woman-years.⁹ It can be inserted either as an interval procedure or after abortion or delivery. All IUCDs have threads which help in removal of the device, reassures its correct placement and retention. In cases where thread is not visible, most of the times IUCD can be removed by IUCD removing hook (commonly known as copper removal hook) as an OPD procedure.

Soon after the delivery female and her husband are usually most motivated for interval and so for the contraception. Considering these facts Government of India promotes CuT insertion soon after the delivery. But despite the fact that the Government of India offers IUCD services free of cost, it still remains largely underutilized.²

Cu T is a non-hormonal IUCD, with few selective problems like device expulsion, missing threads at follow-up and the tendency of increased puerperal bleeding. Missing thread being a significant problem specifically for setups where ultrasound is not available is concerning. Yet there is scarcity of literature on the issue and needs more attention. Giving a thought on missing thread problem one study suggested, change in design of the device or application of a suture to ensure visibility of strings and adjustment and to ensure cost effective hormone releasing devices to reduce puerperal bleeding.¹⁰

Verma et al in their study on 324 IUCD users reported 21.29% (69) subjects with missing IUCD threads. Of these USG confirmed IUCD in situ (82.6%) Displacement was

seen in 10.14% and embedment in 4.35%. Expulsion was quoted in 4.35% women. Their USG findings were comparable with our study. (Table 2). They found missing thread be more common in women with intra-cesarean IUCD insertion within 1 year of time; our study also showed similar trend. They did CuT removal in only 29 women. In 24 women CuT was removed in OPD, as minor OT procedure in 3 and only 1 required removal via hysteroscopy procedure whereas in our study total 23 (40.35%) women out of 57 underwent copper T removal in OT; 21 had hysteroscopic removal and 2 needed laparotomy. (Figure 1) Commonest cause of missing threads was reported to be broken, detached or severed strings.¹¹ we also diagnosed broken or detached thread as most common cause of missing thread.

Vasanthakshmi et al in their retrospective study of patients with missing CuT thread, reported that out of 37 women with displaced IUCD, 17 (45.94%) patients had post placental CuT insertion whereas in our study misplaced CuT was detected in 8 women out of whom 7 had post placental CuT insertion. (Table 2). Contrarily for removal of IUCD with missing threads amongst 37 patients, 12 (32.4%) were removed by simple curettage or using IUCD hook under ultrasound guidance, 21 (56.7%) were removed under hysteroscopy guidance, 1 (2.7%) required laparoscopy and 3 (8.1%) required laparotomy. Noticeably in this study most of post placental insertion of IUCDs were found to be embedded into uterine myometrium or perforated the uterus and required either endoscopy or laparotomy for removal.¹² In our study too, most of the patients needing CuT removal in OT were of post placental IUCD insertion group. (Table 3)

While in a study by Trivedi et al only reporting on Hysteroscopy assisted removal in 32 such cases, quoted IUDs easily removed by withdrawal holding vertical limb with no major immediate or late complication. Post procedure pain was complained by few women who needed intravenous sedation in addition to the paracervical block.¹³ Same was observed in our study too, none of the patient undergoing hysteroscopic removal experienced any major complication. Similar findings were reported in a study by Asto and Habana.¹⁴

The present study was planned to evaluate the co-relation of this complication with special reference to time of insertion of Cu T and intervention required for removal of thus placed IUCD. The study reveals definite impact of timing of CuT insertion on incidence of misplacement and expulsion. This is understandable for involution of uterus and lax cervical opening for intrapartum or immediate post-partum insertions. Similar explanation was given by Houdenhoven et al in their study in relation to intrauterine perforation occurring in postpartum period. They reported uterine involution and increased uterine contractility as potential contributing factors for the same.¹⁵ This also justifies the increased failure of removals attempted as OPD procedure because of more chances of misplacement in post placental insertions. Whether blind procedures

increase misplacement is difficult to predict but immediate referral to a higher centre would definitely avoid deeper imbedding. The exact incidence of CuT being removed is not known and it is possible with little skilful manipulations many mis-positioned CuT must be even getting removed in many hospitals. Contrarily even in tertiary level institutes need for surgical intervention was felt.

From aspect of safety hysteroscopy is ideal specifically after an attempt of failure of removal by Cut Hook or under USG guidance.^{13,14} There can be a personal choice for CuT removal after multiple attempts outside, USG guidance is our first attempt for centrally placed CuT. CuT hook or a long artery are equally preferred instrument for low placed CuT but for one misplaced higher up hysteroscopy is ideal. Using a curettage can be anticipated to be damaging to endometrial lining and may be associated even with a risk of deepening misplaced Cut further.

One of the causes for missing threads could be expulsion with even missed by the user. In an attempt to highlight this problem a study suggested improvisation of device design or application of a suture technique to ensure strings visibility, adjustment and eventually to reduce chances of expulsion. Prevention of misplacement may prove beneficial in reducing puerperal bleeding also.¹⁰ Since hormone releasing devices reduce even bleeding availability of cost-effective hormone releasing would be a double boon as reversible contraceptive in addition to correction of anaemia in developing countries.

From the results of our study, we suggest that common information performa should be developed for all Cut insertions at all centres so that more data can be analysed, to anticipate which patients are at a greater risk of misplacements and expulsions and need early referral to tertiary centres and so that SOP's (standard operating procedures) can be developed for their follow ups. This will help in streamlining the management of such cases and hence will avoid the troubles faced by patients.

Limitations of the study

Our institute being a tertiary institute, receives patients from all peripheral centres and it doesn't have a separate family planning unit so follow up and tracing of patients is a problem. Patients mostly don't come for the follow up and on having any problem consult the doctor at their parent institute. So multicentric study should be planned for better understanding of the problem involving all the referring centres.

In our study, the study cohort is women presenting with missing threads. These women come from different centres and we don't know about the skills and experience of the person removing or inserting CuT; this again points towards the need for a common protocol for the same.

CONCLUSION

Our study concluded that there is definite impact of timing of CuT insertion on incidence of misplacement and expulsion. Immediate referral should be done to avoid deeper imbedding and blind procedures should be avoided. USG guided removal should be the first attempt for CuT removal whereas Hysteroscopy is ideal in cases of failed removal by CuT hook. More studies and data needed for developing a common information performa to develop SOPs for follow up of such patients.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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